ENGINEERING NEWS-RECORD

Engineering Library

NEWS ISSUE – JUNE 13, 1940

JUN 14 1940

Millions for Air Ba

See page 3

UNIVERSITY OF MICHIGAN
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"Best Maintenance Tool We Have!

says this Iowa county official

Franklin County, Iowa, is proud of its Michigan Truck Shovels—Cranes—and even more proud of their production and economy records! But read their letter for yourself—typical of the enthusiasm and praise won by convertible Michigan Truck Shovels, Cranes, Clams, Draglines and Trench Hoes in public service and private construction as well. Every month, more and more construction and maintenance men are becoming "MICHIGAN minded". You'll find real dollars and cents reasons for this in Michigan's Work Book—Write for Bulletin E-60 TODAY.

MICHIGAN
POWER CONTROLS

G. M. ANDERSON
FIRST DISTRICT
DOWS

HERMAN T. JURGENS
SECOND DISTRICT
HAMPTON

FRANK B. HENKE
THIRD DISTRICT
ACKLEY

OFFICE OF
FRANKLIN COUNTY
BOARD OF SUPERVISORS

HAMPTON, IOWA
May 13, 1940

The Michigan Power Shovel Company
Benton Harbor, Michigan

Attention: Mr. D. H. Ross

Gentlemen:

Your distributors in Iowa, The Waterloo Construction Company of Waterloo, Iowa, have asked us to write you regarding our experience with your Michigan truck mounted dragline.

We have used your machine entirely for maintenance work and have never measured the yardage moved, therefore we cannot give you the cost per yard for moving dirt. We use it for the following purposes: stripping gravel pits, stock piling gravel from water, pile driving, repairing grades and ditching, filling driveways, digging trenches and placing large diameter concrete pipe, filling baffle walls, loading gravel trucks, filling bridges and miscellaneous small jobs of about every description, that we used to put off and try not to see, because we did not have suitable, economical equipment to do the work.

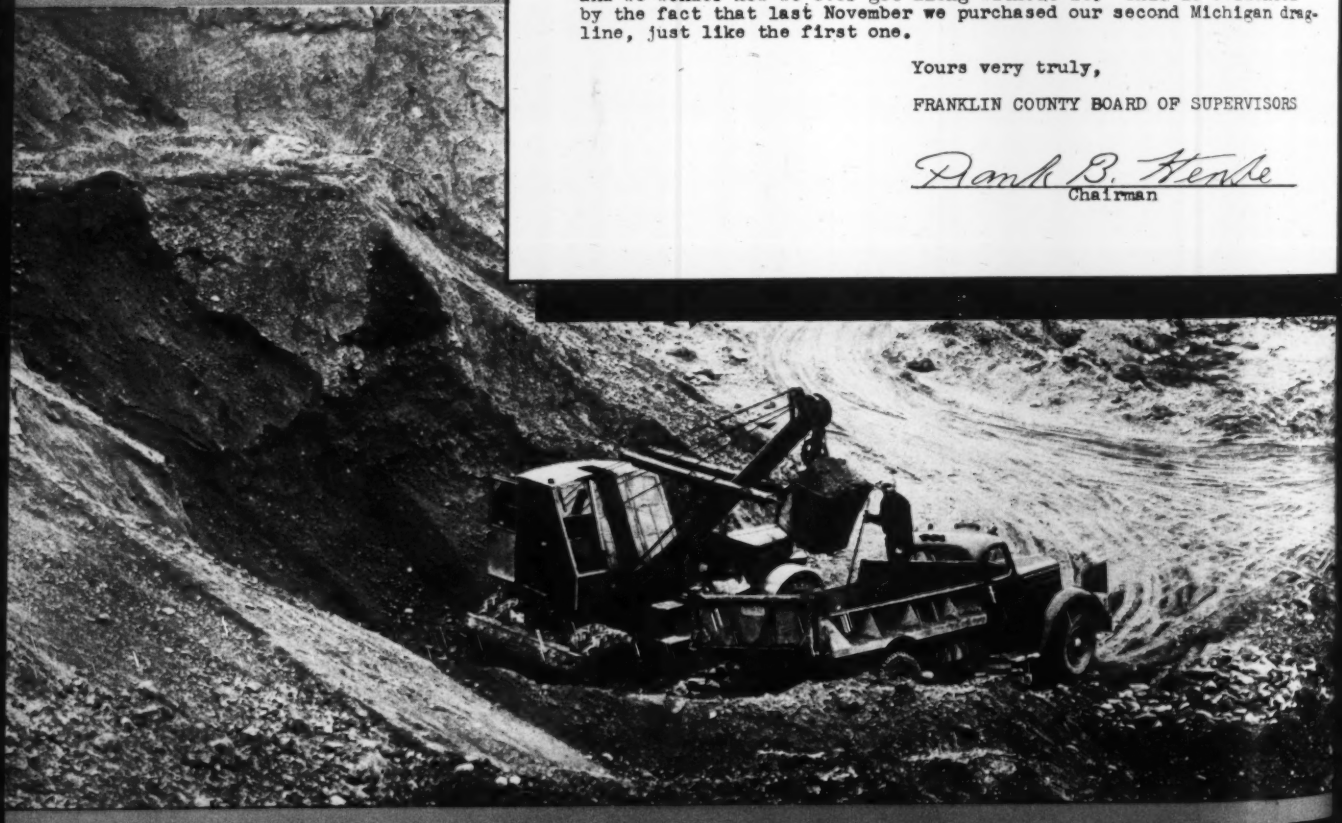
This is the second full year we have used this dragline, operating it more than 2800 hours in 1938 and more than 2600 hours in 1939. Our operating cost per hour, including operator, have been very surprisingly low, gas consumption running between 15 and 18 gallons per ten-hour day; oil, grease, alcohol, repairs, etc., in like satisfactory proportions.

We keep a map on which we spot jobs for the dragline as they come up. We have never been able in two years to complete all the jobs we find for it to do. It is the best gang maintenance tool we have, and we wonder how we ever got along without it. This is evidenced by the fact that last November we purchased our second Michigan dragline, just like the first one.

Yours very truly,

FRANKLIN COUNTY BOARD OF SUPERVISORS

Frank B. Henke
Chairman



MICHIGAN POWER SHOVEL CO., BENTON HARBOR, MICH., U.S.

ENGINEERING NEWS-RECORD

NEWS

Volume 124 JUNE 13, 1940 Number 24

NOTES ON THE NEWS

Quick Surveys of Construction Events

▶ To marshal the forces of the construction industry as part of the nation's defense program, an engineer-architect census has begun. Listing and classifying of 100,000 engineers and 15,000 architects will be handled by the Am. Soc. C. E. and the A. I. A.

▶ Another development in the national defense program is mobilization of the WPA for special construction work. A senate committee has recommended relieving sponsors of defense jobs of the need of assuming part of the cost. Commissioner Harrington has also issued orders to give priority to 73 projects favored by the Army and Navy.

▶ The pending legislation to allow the Army and Navy to do certain construction work in this country by negotiated contracts is also an important move in the defense program.

▶ The Federal Power Commission has approved plans of the Aluminum Company for construction of two more power plants on the Little Tennessee River. The war emergency appears to have loosened up federal control over private work as approval of these projects has been held up for a long time for no apparent reason.

▶ Over in Canada the need for war industry power has resulted in a move for a large increase in diversion of water from the St. Lawrence River for development of power in the Beauharnois plant near Montreal.

▶ Biggest present reservoir of defense money for construction is being released for Army and Navy airbases. Actually available is $215,000,000, and nearly $100,000,000 more is authorized.

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Cover photo by Fairchild Aerial Surveys

Engineer-Architect Census Begun For Defense Construction

Marshalling of information on available design and supervisory personnel begun by A.S.C.E. and A.I.A.—Contractors not included

First move in the long-awaited plan to marshal the forces of the construction industry for the nation's defense program was made on Monday, June 10, with the joint announcement by John P. Hogan, president of the American Society of Civil Engineers, and Stephen F. Voorhees, president of the American Institute of Architects, that a listing and classification of 100,000 engineers and 15,000 architects has been started. Only design and supervisory personnel is included, and no mention is made of a similar plan for construction field forces and firms. The architects' work will head up at their office in Washington while the engineering census will be handled from the Am. Soc. C. E. headquarters in New York.

(Continued on p. 6)

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J. M. JOHNSON, CIVIL ENGINEER, MADE A MEMBER OF THE I.C.C.

J. Monroe Johnson, civil engineer and assistant secretary of commerce since 1935, has been named a member of the Interstate Commerce Commission. Johnson, who attended the University of South Carolina and Furman University, has been engaged in civil engineering work since 1898. Following a period as chairman of the South Carolina State Highway Commission, he saw service overseas during the World War with the 117th Engineer Regiment. As assistant secretary of commerce, Johnson has had jurisdiction over all transportation activities of the Department of Commerce.

St. Lawrence Water For Beauharnois Power

An increase in the diversion of water from the St. Lawrence River for the development of power in the Beauharnois plant above Montreal has been authorized by the Canadian Parliament as a war measure. An increase of 30,000 cfs has been authorized, bringing the total diversion to 83,000 cfs. This will permit the output of the Beauharnois plant to be increased from about 420,000 hp. to 680,000 hp. The added power is to go chiefly to Ontario for use by war industries there.

The Beauharnois plant is a private power project in Quebec that is designed ultimately to develop 2,000,000 hp. at the lower end of a canal around the rapids in the Soulanges section of the St. Lawrence River. The first units in the power plant were put into service in 1932 and additions have been made since that time.

(Vol. p. 823)

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Contractors' Dues Case Did Not Involve A.G.C.

The ruling of the Wisconsin Supreme Court that contractor association dues are illegally collected if based upon volume of contracts obtained was incorrectly reported in these pages in the May 30 issue as applying to the practices of the Associated General Contractors.

The organization that was involved in the suit was the Associated Wisconsin Contractors now known as the Wisconsin Road Builders Association. This organization is not affiliated with the Associated General Contractors of America, the familiar A.G.C., which does not assess its dues on a volume basis but on a flat rate for chapter members, the rate being $500 for the first ten members or less and $40 for each member in excess of ten.

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Frank B. Walker Dies; Boston Consulting Engineer

Frank Bates Walker, consulting engineer and former chief engineer of the Eastern Massachusetts Street Railway Co., at Boston, died at his home at Winthrop, Mass., on June 2. He had been with the company since 1914, excepting a year of war service in 1918.

A native of Michigan, Walker received his technical education at Minnesota and M.I.T., and then spent some 15 years in railroad service. After early employment on the Santa Fe, the Soo and an Alaska railroad project, he became resident engineer for the Great Northern on construction, being engaged for many years on bridge work, double tracking, the Seattle Tunnel and the Lake Superior terminals. In 1914 he went to the Bay State Street Railway Co., Boston, where he served as bridge engineer.

During 1918 he served the government as material engineer on the Boston Army Supply Base, but in 1919 returned to the street railway under its new name, Eastern Massachusetts Street Railway Co., as superintendent of ways and structures, later advancing to chief engineer. During his service the company's properties were rehabilitated, many trolley lines discontinued, and bus service substituted.

Walker was a former president of the Boston Society of Civil Engineers.

New York City Takes Over Rapid Transit Lines

New York City completed the first stage of its rapid transit unification plan on June 12 when it took over the subway and elevated lines of the Interborough Rapid Transit Co. The subways and elevated lines of the Brooklyn-Manhattan Transit Co. passed to the city on June 1. Negotiations for the purchase of these lines have been in progress for many months. The two transit systems that have been acquired by the city are to be integrated with the city-built Independent Subway System, so-called 8th Ave. subway.

At the time of the transfer, service on the 9th Ave. Elevated south of 155th St. was discontinued and that line will be taken down. The 6th Ave. Elevated line was condemned and taken down last year and the 2nd Ave. Elevated north of 60th St., Manhattan, to the Harlem River is to come down. In Brooklyn part of the former B.M.T. elevated lines also are to be removed.

FIRST WATER FLOWS OVER GRAND COULEE DAM

THE FIRST WATER to pass over Grand Coulee Dam, creating a water fall higher than Niagara, flows through three 50-ft. gaps in the spillway crest left low to concentrate overpour in midstream. Most of the discharge when this picture was taken was passing through the 8½-ft. outlet conduits in the dam of which there are a total of 60.

Millions for Airbases

Army and Navy programs, augmented by more money from recent legislation, give construction a big boost

It was almost a year ago that Congress initiated a $140,000,000 program of naval and military airbase construction and thereby set a pattern for things to come. The bulk of that program is just now getting into full swing, and to it present defense legislation adds nearly $75,000,000 worth of additional bases to be put under way as rapidly as possible. Also in furtherance of our step by step plan of air force expansion, nearly another $100,000,000 of airbase work has been lined up and approved for future construction as money is made available. Some of this money will probably be included in the additional billion and a quarter now being prepared by the appropriations committee of the House. The first coherent picture of what is to be built and when is given in the accompanying tabulation.

It will be remembered that the President, in his first defense message to Congress, said that he would like to see an airforce of 50,000 planes. Most of the public and much of the press still assumes that some such plan is embodied in the $4,500,000,000 defense appropriations. Actually, fewer warplanes will be bought under the new bills than were ordered last year.

Aviation procedure now is that most of this country's expanded aircraft production (and informed circles believe it may reach a rate of 35,000 a year by June, 1941) will go abroad, and that for the present we will concentrate on a greatly enlarged program of pilot training. This year's airbase appropriations, with one major exception, the Alaskan base, are determined by this viewpoint.

The Army, which decentralizes its training among many commercial flying schools, will spend $10,000,000 on temporary additional facilities at various fields throughout the country. The Navy has hitherto done all its training at the Pensacola school. Now, however, it is building a brand new school at Corpus Christi at a cost of $25,000,000, expanding the facilities at Pensacola at a cost of $4,000,000, providing training facilities at the new Jacksonville base at a cost of $12,500,000 (including a trade school for enlisted men), and converting an existing base at Miami into a training center.

Construction at all these points will be of a temporary type that can be carried out quickly. Hangars will be steel frame with corrugated asbestos for sidings and roof and concrete floors. Other buildings will be wood frame with asbestos siding and wood floors. As an example of the use to which the money will be put Corpus Christi may be cited. Here about $13,500,000 will go for buildings and structures—hangars, barracks, shops, storehouses, etc.—about $6,500,000 for dredging, grading, roads, etc., about $600,000 for railroad construction, and the remainder for equipment. The job will require 12,000,000 man-hours.

As stated the one major project with a strictly military purpose is the Anchorage base, which is intended to be the main defense for Alaska. A smaller base was started last year at Fairbanks, but this is primarily for experiment in cold weather flying. Immediate construction of the Anchorage base is felt necessary because of the necessity for protecting the new naval bases there and because of the construction of several Russian bases on the Siberian coast.

Details of the Anchorage base have not been announced, but it is known that priorities have been established by which the first step will be erection of temporary barracks for a battalion each of infantry and field artillery, followed by construction of the airfield itself, temporary air corps barracks, barracks for a larger ground garrison, and, if the money holds out, permanent barracks for the air corps personnel.

AIRBASE PROJECTS ADDED IN NEW DEFENSE PROGRAM

	Appropriated or Contracts Authorized		Additional money in pending bills	Authorized in pending bills (no money)
ARMY				
Anchorage, Alaska			$12,104,000	
land purchase			85,000	
Emergency training fields			10,000,000	
NAVY				
Corpus, Christi, Tex			25,000,000	
Jacksonville, Fla. (expand)			12,500,000	
Miami, Fla. (expand)			3,500,000	
Pensacola, Fla. (expand)			4,000,000	
Alameda, Cal. Air Station (expand)			3,382,000	$6,861,000

AIRBASE PROJECTS STARTED LAST YEAR (LARGER PROJECTS ONLY)

		Present status		
ARMY — TOTAL	$80,157,000			
Panama Base	12,942,000	well underway		
Puerto Rico Base	8,624,000	partially in use		
Fairbanks, Alaska	4,000,000	grading underway		
McChord Field, Wash	1,268,200	in use		
Chicopee Falls, Mass. Base	3,613,000	grading underway		
Tampa Fla. Base	3,173,000	in use	$848,000	
Mobile Air Depot	7,275,000	work started		
Ogden, Utah, Air Depot	3,516,000	work started		
Improvements to:				
Hickam Field, Hawaii	10,369,000			
Wheeler Field, Hawaii	1,784,000			
Albrook Field, Panama	9,149,000		1,000,000	
Chanute Field, Ill	3,268,000			
Duncan Field, Texas	2,005,000			
Lowry Field, Col	1,944,300			
Patterson Field, Ohio	2,049,000			
Wright Field, Ohio	1,500,000		1,840,000	
NAVY — TOTAL	62,000,000			
Jacksonville, Fla	15,238,000	under contract	see above	
Banana River facilities	1,940,000	" "		
Pensacola, Fla	5,770,000	" "	see above	
Tongue Point, Ore	1,478,000	" "		2,000,000
Quonsett Point, R. I	1,000,000	" "		24,204,000
Norfolk, Va	500,000	" "		13,246,000
San Juan, Puerto Rico	8,330,000	" "		2,330,000
Kodiak, Alaska, Base	29,800,000	" "		2,012,000
Sitka, Alaska	2,939,000	" "		
Kaneohe Bay, Ohu	5,714,000	" "		
Pearl Harbor Base	2,633,000	" "		5,807,000
Midway Island Base	3,720,000	" "	1,550,000	
Johnston Island Base	1,030,000	" "		
Palmyra Island Base	1,510,000	" "		

NAVY PROJECTS AUTHORIZED BUT NO MONEY MADE AVAILABLE (LARGER PROJECTS ONLY)

Coco Solo, C. Z	12,690,000
Seattle, Wash	4,670,000
Wake Island	5,582,000
Quantico, Va	2,326,000
Guantanam, Cuba	2,886,000
Charlotte Amalie, V. I	1,510,000
San Diego, Cal	5,637,000
Unalaska, Alaska	2,963,000
Canton Island	1,500,000

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Large Flood Control Dam Approved in Pennsylvania

Pennsylvania's water and power resources board has approved construction of a $23,000,000 flood control dam on the Conemaugh River near Saltzburg, in Indiana County, Pa. with the stipulation that the dam not be used for generation of hydro-electric power. Gov. James has concurred in the approval.

The proposed reservoir is to be of the flood retention type about 29 miles above Pittsburgh. Much of the preliminary survey work has been completed by the Army engineers.

Surface Protection Added

ROCK-REVETTED fill insulates downstream face of dam against cold; shotcrete protects the upstream face. Crest of fill finished with a substantial oiled surface for use as a roadway and working area for maintenance operations.

d Dams at High Altitudes

To ARREST the combined destructive effects of very pure water, low temperatures of a high altitude, and lack of refinement in cement and concrete manufacturing techniques of 25 years ago, the Southern California Edison Co. has done extensive work to protect the exposed concrete surfaces of the four dams creating Huntington Lake Reservoir (El. 6,950 ft.) in Fresno County, Calif.

Placement of rock-revetted fill against the downstream side of each structure for insulation against the cold air is a major part of the work. But before this could be done, it was necessary to construct at Dam No. 1, which was an overflow structure with auxiliary siphon spillways, a new auxiliary spillway consisting of fifteen 5x12-ft. weir gates to provide 16,000 cfs. discharge capacity.

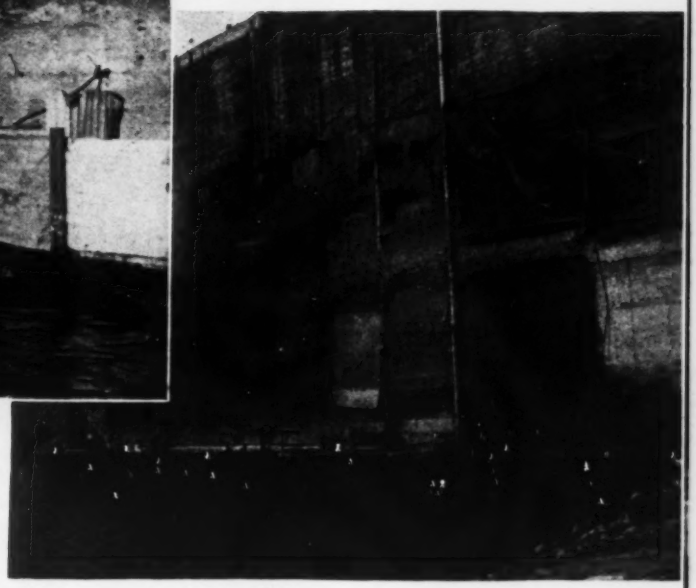
The fills for all the dams were made of unselected rock and earth excavated or quarried nearby. The top of each fill was finished with a substantial oiled surface for use as a roadway and working area for maintenance operations. The four fills totalled 414,000 cu.yd. and 30,000 cu.yd. of quarried rock was put in the revetments.

The fill work was followed during the low-water seasons with repairs to the upstream faces where the concrete was most severely disintegrated. This required placing about 25,400 sq.ft. of reinforced and 6,900 sq.ft. of unreinforced shotcrete. Reinforcement consisted of galvanized, welded wire mesh made of No. 6 wire on 3-in. centers. Before fastening the mesh to the face of the dam by ½-in. dowels sulphur-grouted 34 in. below the face, the area to be repaired was chipped down to material having adequate bonding value.

The shotcrete, a 1-to-4 mix, was placed to an average thickness of about 3½ in. In an effort to obtain low solubility of hydrated cement when exposed to pure but acid water, a special cement made to Merriman specifications for the New York City Board of Water Supply was used.

Fills were placed by the Lang Transportation Co., spillway and rock revetment work was done by S. D. Betchel Co., and repair work on the upstream face of the dams was done by Stone & Webster Engineering Corp. H. W. Tice was in charge for the owners.

SHOTCRETE, 3½ in. thick, goes in place over welded wire mesh on upstream face.



STEAM CURING shotcrete beneath canvas on wood frames during freezing weather.

MEETINGS

AMERICAN SOCIETY FOR TESTING MATERIALS, annual meeting, Atlantic City, N. J., June 24-28.

SOCIETY FOR THE PROMOTION OF ENGINEERING EDUCATION, annual meeting, University of California, Berkeley, Calif., June 24-28.

AMERICAN SOCIETY OF CIVIL ENGINEERS, annual convention, Denver, Colo., July 24-26.

REGION AND LOCAL

MONTANA ASSOCIATION of County Commissioners, annual convention, Havre, Montana, June 17-19.

UTAH SOCIETY of Professional Engineers, Emigration Canyon, June 19.

MISSISSIPPI SOCIETY OF PROFESSIONAL ENGINEERS, summer convention, Biloxi, June 24-25.

CAROLINAS BRANCH, Associated General Contractors of America, summer convention, Myrtle Beach, S. C., July 12-13.

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Engineer-Architect Census

(Continued from page 1)

According to the announcement the census will be undertaken in three steps. Already started, the first step will involve listing of engineering and architectural firms, partnerships and individuals in private practice; this is being accomplished by the numerous national engineering and architectural organizations through special local section committees.

The second step will consist in indexing and classifying each firm or individual according to qualifications so as to permit ready selection of those best fitted to undertake in any part of the country whatever type of engineering work would be necessary in the interests of national defense.

The final step will be similar to the first two in all details except that, instead of firms, there will be listed and classified the architects, engineers, draftsmen, surveyors and specialists, who may be available to work with firms that are assigned jobs to design and supervise.

The first two steps, it will be noted, concern a census of engineering employers as distinct from employees. This being the part of the work now under way, procedure is well worked out. Step three, which touches the individual employee, and seeks to list his capabilities and availability for work with these employers, is still in the future, and definite plans for procedure are not yet worked out, according to best available knowledge.

In the preparation of the census, it is announced, every effort will be made to avoid dislocation of those engineers or architects now engaged in industry, in the utilities, and in the governmental services. Account will be taken also of those in the National Guard or Reserve Corps.

Organizations cooperating with the Am. Soc. C. E. and the A. I. A. on the census include: the American Institute of Mining and Metallurgical Engineers; American Society of Mechanical Engineers; American Institute of Electrical Engineers; American Institute of Chemical Engineers; American Institute of Consulting Engineers; American Society of Heating and Ventilating Engineers; American Society of Military Engineers; American Society of Refrigerating Engineers; and the National Society of Professional Engineers.

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Cajalco Reservoir Renamed Lake Mathews

The Metropolitan Water District of Southern California has renamed the terminal reservoir of the Metropolitan Aqueduct, now known as the Cajalco Reservoir, Lake Mathews in honor of the late W. B. Mathews, who was the first general counsel for the water district. The title has been approved by the Board of Directors of the district.

JOBS OF THE WEEK

RAILROAD GRADE SEPARATIONS, Syracuse, N. Y.

Elmhurst Contracting Co., Corona, N. Y., is reported to have contract for a large grade crossing elimination project for the Delaware, Lackawanna & Western R. R. Work includes building two-track earthen embankment within concrete retaining walls in downtown section and construction of 17 bridges of steel and concrete. A new station will also be required.

CHEMICAL PLANT, Texas City, Tex.

Ford, Bacon & Davis, Inc., New York, will build a chemical plant at Texas City, Tex. for Carbide & Carbon Chemicals Corp., $2,600,000.

STEEL BLAST FURNACE, Lorain, O.

Arthur G. McKee & Co., Cleveland, O., has been awarded the contract for construction of a 1,000-ton daily capacity steel blast furnace for National Tube Company, Lorain, O. Estimated cost $1,500,000.

ROADS, New York, N. Y.

Del Balso Construction Corp., New York, was low bidder on grading, drainage, paving and bridges for Eastern Blvd. and Hutchinson River Parkway extensions, $881,333. This is the new express highway that will connect the Triborough and Whitestone bridges with Westchester parkways.

FLEET SUPPLY BASE, Oakland, Calif.

N. P. Severin Co., Chicago, Ill., was awarded the contract for the storehouse of the U. S. Navy Fleet Supply Base, Oakland, Calif., $1,045,000; M. H. Golden, San Diego, will construct the reinforced concrete marginal wharf, $608,000.

BREA DAM, Fullerton, Calif.

Winston Brothers Co., Los Angeles, was low bidder at $664,401 for constructing Brea Dam, a U. S. Engineer earth dam project in Santa Ana Basin, Orange County, Calif., for flood control. Rolled fill structure 1240 ft. long with maximum height of 84 ft. and reinforced concrete spillway.

AIRCRAFT ENGINE PLANT, East Hartford, Conn.

Turner Construction Co., Boston, Mass., will construct for the Pratt & Whitney Aircraft Division, United Aircraft Corp., East Hartford, a plant for the manufacture of aircraft engines. The contract to supply 1,750 tons of structural steel was awarded to R. C. Mahon Co., Detroit, Mich. Albert Kahn, Detroit, designed the plant, which is part of an $8,000,000 expansion program.

NOTE—Additional bidding and contract news on over 600 projects, large and small, appears in the Construction News Section beginning on page 13.

President Again Vetoes Waterway Bridge Bill

President Roosevelt on June 10 vetoed a bill calling for a change in the present method of allocating the cost of altering bridges over navigable waterways, transferring part of the cost from the owners to the federal government. Last year Congress passed a similar bill during the closing days of the session. It was vetoed by the President after Congress adjourned.

Under the present system of allocating costs when improvements or changes in waterways require the reconstruction of railway and highway bridges, all the cost is assessed against the owners. In many instances, this has resulted in the assessment of very heavy costs against the railroads without any commensurate benefit. Under the bill passed by both houses of Congress, the owners were to be assessed only that part of the cost that would result in benefits to them, as in reduced maintenance or operating costs.

WPA Mobilization for Defense Starts

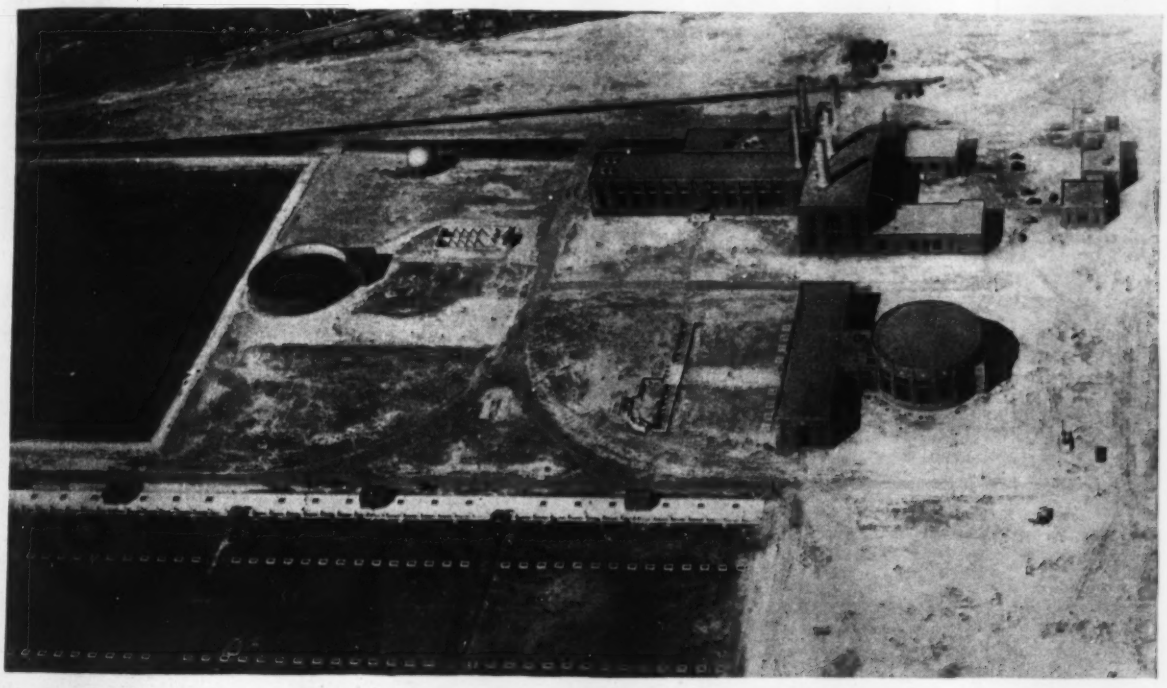
Senate would relieve sponsors of all cost for defense projects: Harrington gives priority to 73 jobs favored by the Army and Navy

Moves were made in several directions last week to mobilize the WPA as part of the national defense program. The Senate committee considering the relief appropriation recommended that project sponsors be relieved of the necessity of contributing 25 per cent of the cost of projects connected with the national defense preparations.

At the same time an intensification of the existing policy of giving preference to defense projects occurred when WPA Commissioner Harrington instructed state administrators to give complete priority to 73 specific projects picked out by the Army and Navy as of first importance. All available forces will be devoted to early completion of these projects, if necessary at the expense of other nearby projects. Cost of the projects is estimated at $30,000,000 for the federal government and $6,000,000 for the sponsors.

Dominant among the priority projects are improvements to municipal and military airfields, but they also include considerable work on providing housing and other facilities for the enlarged army, camp and cantonment construction, and some work at Navy yards. Some of the projects are already underway and will be speeded up, while others have still to be planned.

Cost of this work is not yet available, but Commissioner Harrington estimates that projects of defense value, including the 73 first priority jobs, will use about a quarter of WPA's billion dollar appropriation and will employ about 500,000 WPA workers.



DETROIT'S NEW SEWAGE TREATMENT WORKS DEDICATED

COVERING a 72-acre tract and built as part of a $27,000,000 treatment and collecting system, Detroit's new sewage treatment works was dedicated June 1. The plant is designed for a population of 2,500,000, half a million more people than now live in Detroit. It has a peak capacity of 715,000,000 gallons of sewage daily. Construction of the plant proper was completed Jan. 1 and it was placed in operation Feb. 28, with partial treatment by screening, sedimentation and chlorination provided.

In the above view the circular building at the right is the pumping station; adjoining are the trash rack and grit chamber enclosure. The building nearer the top and at the extreme right is the chlorination building. To the left of this structure is the sludge incinerator building (with tall stacks), and the long building adjoining at the left is the sludge filter building. The digestion tank is the low structure farther to the left and at the extreme left are the ash lagoons. The sedimentation basins appear in the immediate foreground.

George R. Thompson is city engineer of Detroit.

The sewerage system includes 600 mi. of interceptor and trunk sewers and more than 2,000 mi. of laterals.

As traffic engineer of the Chicago Park District **Otto K. Jelinek** is interested in the movement of 63,400,000 park patrons who drive over a million miles through the park every year. His department regulates 1,427 traffic signals and marks over 4,000,000 linear ft. of lacquer lanes per year. He supervises the movement of ninety bus companies. In the picture the need for repainting the pavement striping at a busy Michigan Av. corner is being pointed out.

Latest move for **J. E. Walters,** until recently construction superintendent at Hiwassee and Pickwick dams for the Tennessee Valley Authority, was to Marshall Ford Dam at Austin, Texas, where he will be general construction superintendent for Brown & Root, Inc., and McKenzie Construction Co. Prior to joining TVA in 1935, Walters was superintendent for Stevens Bros. and The Miller Hutchinson Co., New Orleans, on various waterway structures.

Illinois State Register Photo

Since Springfield, Ill., is using WPA labor on most of its projects at present, **Lewis Lush,** new city engineer, is finding his former experience as WPA area supervisor in Illinois highly valuable. Before serving with the 23rd Engineers during the World War, Lush was connected with the Little River drainage district. Later he worked with the Illinois State Division of Highways as construction engineer, and with Perry McGlone Construction Co., Kansas City.

These three Bureau of Reclamation Engineers are on the front line of what promises to be one of the busiest jobs in the West, namely, the Friant Dam project in California. They are, left to right, **James H. Warner,** resident engineer on the dam; **A. A. Whitmore,** resident engineer on the canals, which are to extend 40 miles north and 162 miles south of the dam, and **Roy B. Williams,** construction engineer in charge of the Friant Division. Friant Dam will be 300 ft. high and 3,430 ft. long to contain 1,900,000 cu.yd. of concrete. When completed it will be the fourth largest concrete dam in the United States.

Arthur M. Shaw (left), PWA engineer on the $1,000,000 Metarie sewer and sewage disposal project in a large suburb just outside the city limits of New Orleans, **Willis McDonald** (center), representative on the job for the local commissioners, and **Waldo S. Powell, Jr.,** resident engineer on the sewage disposal plant for George P. Rice, consulting engineer. Some years ago Shaw was engineer for the drainage district that provided the same region with levees and a drainage system and opened it up for suburban use. The area has never had sewers until the present work was undertaken as a PWA project.

MEN AND JOBS

JULES LEBLANC, civil engineer, is now consultant for the technical services in Montreal of the department of labor of the province of Quebec.

COL. DONALD H. CONNOLLY, now stationed at Fort Logan, Colo., has been named head of the Pittsburgh district of the U. S. Engineers to succeed LIEUT. COL. W. E. R. COVELL, who has resigned. CAPT. HERBERT D. VOGEL, now stationed at the engineering school at Fort Belvoir, Va., has been named assistant district engineer. LIEUT. COL. J. D. ARTHUR, JR., of the Huntington, W. Va., district, has been temporary head of the Pittsburgh district.

O. QUEVILLON, civil engineer, has been appointed city engineer for St. Hyacinthe, Que. Since graduation from Ecole Polytechnique of Montreal, with a civil engineering degree, Quevillon has been with the department of public works of Canada, being located at Montreal.

JOHN H. ATHERTON, former surveyor of Franklin County, Pa., has been named borough engineer at Shippensburg, Pa. to succeed CLARK A. BRYAN, Carlisle, who held the post for several years.

CHARLES E. BARNES, superintendent of the Elwood, Ind. Water Co. for the last 25 years, has been replaced by VERNE WILLETTS, effective June 1.

JOHN S. WILEY, engineer with the Bureau of Industrial Hygiene, Indiana State Board of Health, on June 1 began new duties at New Orleans, La., as assistant sanitary engineer with the state sanitary district No. 4, U. S. Public Health Service. His headquarters will be at the U. S. Marine Hospital.

LIEUT. COL. W. D. STYER, student at the Army Industrial College, Washington, D. C., has been ordered to do duty as student in the Army War College, Washington, D. C., effective Sept. 1.

LIEUT. COL. C. H. CUNNINGHAM, assistant to division engineer, North Atlantic Division, U. S. Engineers, Sept. 1 will begin new duties with the 8th Engineer Squadron at Fort McIntosh, Tex.

C. C. KIRBY, St. John, N. B., and resident engineer of the Canadian Pacific Railway for the New Brunswick district since 1915, has retired. He has been succeeded by A. O. WOLFF, who has been acting engineer. Kirby in 1907 joined the engineering department of the Grand Trunk Railway, Toronto. In 1909 he shifted to the Canadian Pacific at Ottawa, Ont. as transitman. The next year he was transferred to Montreal, and in 1912 became assistant engineer of maintenance of way at Montreal before being sent to St. John. Wolff started his engineering career with the Canadian Pacific Railway at Montreal in 1908 as rodman. He has held the positions of draftsman, transitman and assistant engineer at Montreal and resident engineer at Chapleau, Ont., Brownville Junction, Maine, and London, Ont., as well as assistant district engineer at Toronto.

MAJ. CLARK KITTRELL, district engineer, Fort Peck District, U. S. Engineers, has been promoted to the rank of lieutenant-colonel.

RALEIGH E. STALLINGS, assistant city engineer for the past 13 years at Tucson, Ariz., has been named city engineer. Previous to joining the city engineering staff, Stallings has worked with the National Bridge Co., Indianapolis, Ind., the Illinois Central, the Missouri Pacific and the Santa Fe railroads. He had also worked with the city engineering department at Los Angeles, the Arizona State Highway Department, and the U. S. Indian Service.

RALPH C. CHANEY, former planning engineer for the city of Columbus, Ohio, has been appointed planning and coordinating engineer for the Ohio State Highway Department, according to announcement by State Highway Director ROBERT S. BEIGHTLER. Chaney will be assigned the task of coordinating the extensive highway improvement in Cuyahoga County, which will be possible due to recent approval of a $4,500,000 bond issue.

CAPT. W. W. BESSELL, JR., student, at the Command and General Staff School, Fort Leavenworth, Kan., has been transferred to the office of the Chief of Engineers, Washington, D. C.

H. MOORE METCALFE, bridge inspector for the Iowa highway commission and part-time surveying instructor at Iowa State College, has been named instructor in civil engineering at the University of Idaho.

F. L. SCHWEARINGEN, former construction engineer for the Pennsylvania Turnpike Commission, Harrisburg, Pa., has been named superintendent of construction for the Quartermaster on the new air base at Borinquen Field, Punta Borinquen, Porto Rico. Schwearingen, who began his new duties in February, worked for a time as designing engineer and superintendent of construction for the Southern California Edison Co., Los Angeles, Calif. He has also been employed in China as superintendent of construction for the general Petroleum Corporation, Los Angeles, Calif.; as chief engineer of operation for the Goldfields Ltd., London, at Zaragosa Colombia, South America; in South America as superintendent of construction for the Tropical Oil Co.; and as construction engineer with Carnegie-Illinois Steel Corp.

CAPT. STANLEY J. HORN, executive engineer for the U. S. Engineer District Office at Louisville, Ky., has been transferred to the Panama Canal Zone, his new duties starting June 1.

GEORGE H. SAGER, JR., executive director of the Louisville, Ky., municipal housing commission, has resigned to join Ford, Bacon & Davis, Inc., New York City. Sager, who worked for a time as engineer with the PWA, has been director of the housing commission since November, 1938.

H. C. HUNTER, civil engineering graduate of Iowa State College in 1913, has been made vice-president of the American Bridge Co. Hunter worked on the construction of the Oakland Bay Bridge in San Francisco.

IVER SVERDAHL, Waterloo, Iowa, construction superintendent of the Jens Olesen & Sons Construction Co., has obtained a patent on a screed for concrete floors.

KENNETH EATON, a graduate of Iowa State College in the class of 1932, and recently in the engineering department of the Loup River Public District, Columbus, Neb., has begun new duties as steel designer of the Newport News Drydock & Shipbuilding Co., Newport News, Va.

ROBERT R. CUNNINGHAM, a graduate of Iowa State College in 1936 with a civil engineering degree, has begun new duties as sanitary engineer with the Illinois State Department of Health. Cunningham has been working on hydraulic studies with the U. S. Engineers.

LIEUT. COL. RAYMOND G. MOSES, district engineer at Vicksburg, Miss., for the U. S. Engineers, has been ordered to do duty with the 5th Engineers, Fort Belvoir, Va., effective July 10.

OBITUARY

GEORGE EDWARD WATTERS, 62, who was appointed city engineer of New London, Conn. in 1921, died at New London June 3. Watters first worked in the water and sewer department of New London, joining that department in 1902.

BENJAMIN CHARLES MILNER, SR., 79, state highway engineer of Georgia for 16 years before retiring in 1933, died in Atlanta June 5. Milner, who graduated from the University of Georgia as a civil engineer in 1882, at one time was employed as special evaluator for the Interstate Commerce Commission. He also worked as division superintendent for the Southern Ry.

JOHN MCMAHON, 75, for many years engineer at the Willoughby, Ohio waterworks, died June 6 in Cleveland.

GEORGE MATTLIN, 66, erecting engineer for Allis-Chalmers Mfg. Co., Milwaukee, for 27 years, died in Milwaukee May 31.

REGINALD B. TURNER, civil engineer of South Devon, N. B., died in that city recently. Soon after his graduation from the University of New Brunswick in 1916, Turner enlisted in the 12th Siege Battery artillery of the Canadian Expeditionary Force, serving overseas during the World War. On returning to Canada he entered the civil engineering profession to practice for the remainder of his life.

WALTER E. RUNDLETT, 60, for the past 15 years superintendent of the water department at Watertown, Mass., died in that city June 3. He had been with the Watertown water department for 40 years.

H. T. MCDONALD, 48, research engineer for Caterpillar Tractor Co., died in Peoria, Ill. June 3. He had been employed by "Caterpillar" and its predecessor, the Holt Mfg. Co., for 22 years. McDonald, a graduate of Bradley Polytechnic Institute, was an authority on track-type tractor design.

FRANK Z. LEE, 65, employee of the Los Angeles County Flood Control District since its inception, died in Los Angeles June 5. Lee, after conducting the preliminary investigation as to the advisability of the formation of the Los Angeles district, was employed by that organization as resident engineer on construction of Puddingstone Dam.

JAMES O. CONNELL, 77, retired civil engineer who directed the installation of the waterworks system for the city of Superior, Ariz., died June 2 in Florence, Ariz.

CHARLES A. BISSEL, 52, contractor at Fargo, N. D., died recently in that city. Bissel was a former member of the firm of Austad & Bissel.

BASCOM LITTLE, a builder and former president of the Crowell & Little Co., died May 27 in Cleveland. Little's firm built the Cleveland News Building, the Detroit News Building, Hotels Allerton and Bolton Square in Cleveland, and buildings at Oberlin College and Cornell University. Little was a graduate of the latter school.

ROBERT S. CORRY, 72, engineer with the Alabama State Highway Department, died in Birmingham a few days ago.

CHARLES MCCAULEY, 74, retired civil engineer of Santa Fe, N. M., died May 28 in Winslow, Ariz.

CONTRACTS AND CAPITAL

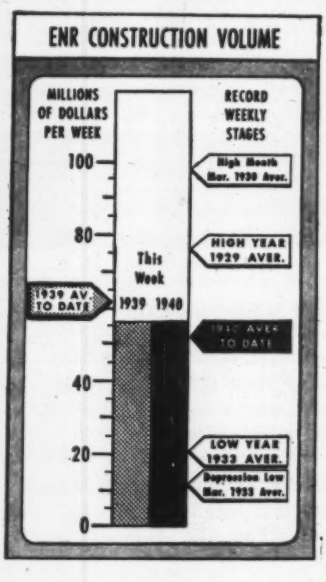
PRIVATE ENGINEERING construction awards for the week increased sharply, topping last week by 103 per cent, and the corresponding 1939 week by 173 per cent. Despite the private gains, total awards for the week, $56,641,000, are 13 per cent lower than a week ago, due to a 45 per cent drop in public construction volume. The total, however, is 2 per cent greater than in the 1939 week in spite of a 38 per cent decrease in public awards.

The week's volume brings 1940 construction to $1,258,461,000, a level 15 per cent under the $1,474,781,000 reported for the 24-week period last year. Private awards, $435,364,000, are 20 per cent higher than in the period a year ago, but public construction, $823,097,000, is 26 per cent lower.

The week's industrial building volume, $18,013,000, is the largest reported since the week of June 24, 1937. It is due primarily to commencement of work on large projects in the east and southwest. In addition to industrial buildings, bridges, commercial building and large-scale private housing, and public buildings are above their volumes for the week a year ago; and bridges are higher than in the preceding week.

New capital for construction purposes for the week, $13,604,000, is 29 per cent above the volume for the corresponding week last year. The current week's total is made up of $6,826,000 in USHA loans to four cities, $3,518,000 in state and municipal bonds, and $3,260,000 in corporate security issues.

New construction financing for the year to date, $610,873,000, is 32 per cent below the $900,268,000 reported for the 24-week period in 1939.



CONTRACTS

(Thousands of dollars)

	Week Ending June 15 1939	June 6 1940	June 13 1940
Federal	$15,495	$4,677	$4,473
State & Municipal	29,344	46,049	23,243
Total public....	$44,839	$50,726	$27,716
Total private...	10,586	14,241	28,925
TOTALS	$55,425	$64,967	$56,641
Cumulative 1940 .....(24 weeks)...			$1,258,461
1939 .....(24 weeks)...			$1,474,781

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial building, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	1939 24 Wks.	Cumulative 1940 24 Wks.
NON-FEDERAL ...	$588,841	$610,873
Corp. Securities..	125,015	88,149
State & Mun.....	307,368	430,644
R.E.A. loans.....	37,801	.....
U.S.H.A. loans...	116,226	85,256
R.F.C. loans.....	2,431	6,824
FEDERAL	$311,427	$.....
TOTAL CAPITAL..	$900,268	$610,873

FHA MORTGAGES

	Week Ending June 10 1939	June 1 1940	June 8 1940
Selected for appraisal $23,950		$22,787	$28,163*
Cumulative 1940 .....(23 weeks)....			$554,452*
1939 .....(23 weeks)....			$532,617

* Subject to revision.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	June '40..	241.59	116.13
Building Cost	June '40..	201.65	109.09
Volume	May '40..	201	88

Power Projects Approved On Little Tennessee River

Approval of two additional hydro projects on the Little Tennessee River system has been announced by the Federal Power Commission, and as soon as other interested government agencies give their approval the Nantahala Power & Light Co., subsidiary of the Aluminum Company of America, plans to begin construction.

The two projects, Nantahala and Glenville, would be the highest head developments east of the Rocky Mountains, the former with a head of 999 ft. and the latter with 1,215. The power installation at each of the two would be a single turbine, of 60,000 and 30,000 hp. respectively, increasing the company's Little Tennessee River generating capacity to 364,000 hp.

Nantahala Dam, a rockfill dam with earth facing, would be 260 ft. high and create a reservoir of 1,631 acres surface area on the Nantahala River in Macon county, N. C., about 90 miles south of Asheville. The Glenville Dam, of the same type, would be 130 ft. high with a reservoir of 1,470 acres, on the west fork of the Tuckaseegee River in Jackson County, N. C. The two dams involve yardages of 1,829,000 and 458,000.

In addition to developing local power, the two storage reservoirs would provide storage against low water periods and would assist in leveling out the flow of water and power in the company's hydro projects farther downstream, Santeetlah, Cheoah and Calderwood.

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Cloudburst Damages Northeastern Nebraska

As a result of 6 to 10 in. of rain during the night of June 2, flash floods devastated a large area and took twelve lives in northeastern Nebraska. Homer, where 75 per cent of the buildings were demolished, and Winnebago were the hardest hit when Omaha Creek went on a rampage. Other towns damaged include Walthill, Goodwin City, Willis, Hubbard and Jackson. Logan, North Omaha and Elk Creeks were also in flood.

F. T. Darrow, chief engineer of the Burlington R. R., reports heavy damage to 14 miles of line between Walthill and Homer, including 22,700 ft. track off embankment, 5,100 ft. of embankment washed out and 25,000 ft. of track buried in the mud. Water ran 5 ft. deep over the tracks in places. The railroad station at Winnebago was washed away and the agent drowned. Major damage to railroad bridges was in heavy washouts back of abutments. Service on the Burlington was resumed June 11. The Northwestern R. R. was damaged at Hubbard. Main highways, including U. S. 77, were not badly damaged, being passable the next day.

Records of the Burlington R. R. show that Omaha Creek had silted up as much at 12 ft. in the past 30 years, greatly reducing channel capacity.

Another storm June 8 in opposite corner of Nebraska broke three private dams on Whitewater Fork flooding the towns of Hamlet, Palisade and Wauneta, the latter town being isolated. This storm also damaged a main line of the Burlington R. R. between Brush and Akron, Colorado, as well as a branch line.

SANTA CLARA VALLEY DISTRICT HONORS FORMER ENGINEER

THIS BRONZE TABLET was set last month in the concrete of Coyote Dam near San Jose, Calif., in memory of the late Fred H. Tibbetts, chief engineer of the Santa Clara Water Conservation District and leading figure in organizing and carrying out the highly successful Santa Clara Valley water conservation program. The tablet was placed at the conclusion of Scottish Rite funeral services in the presence of about 100 engineers, who had made the trip to the dam to do honor to the memory of their friend. Tibbetts died about two years ago.

Negotiated Cost-Plus Contracts In Army and Navy Plans

Pending legislation would give power to do domestic construction work by method now used successfully for Navy work outside the country

Both Army and Navy are now getting ready to exercise the new power they will have under pending defense legislation to contract by negotiation for certain construction work in the United States. For several years they have had authority to do this on work outside the United States. The Navy has regularly taken advantage of this power and feels that its work has been greatly expedited thereby (the Navy's airbase program started last year is rather farther along than the Army's similar program). The Army has been more doubtful, in the past, of the value of negotiated contracts. Last fall it prepared to award some contracts in the Canal Zone on this basis but changed its mind when, after the initial shock of the war, the construction situation stabilized; the work was awarded competitively.

However, in the interests of speed, it appears that Army too will negotiate a good many of its contracts. It is felt that as much as three months can often be saved in this way—not only through omitting the advertisement period, but also because cost-plus-fee contracts can be awarded before detailed drafting of plans are complete.

Another inducement to the use of this procedure is the uncertainty about the future in contracting circles—a condition which might result in hesitation to bid on lump-sum competitive contracts. Such hestitation was evident last fall but seemed to disappear as the war continued quiescent; now it is again rising.

It is admitted that the negotiation procedure is likely to result in restricting most of the defense construction to a comparatively small number of larger contractors—unless Congress should provide for a great deal more construction than it has so far. The Bureau of Yards and Docks and the Quartermaster Corps have lists of several hundred contractors who would be invited to submit proposals on any work, and other contractors desiring to be considered have been notified to submit statements of their experience, equipment, personnel, and financial condition.

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Allied-Owned Firm Builds Big Powder Plant in U. S.

The Tennessee Powder Co., which is a new corporation with the capital stock owned by Anglo-French Purchasing Commission, has made arrangements for a large powder plant to be built and operated north of Memphis, Tenn., by the E. I. duPont de Nemours & Co. The plant, to manufacture smokeless powder for the British and French military forces, will be built in Shelby County, north of Memphis. The work is estimated to cost $15,000,000.

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

FENCING PENNSYLVANIA TURNPIKE

OWNER: Pennsylvania Turnpike Commission, P. B. Noftsker, secretary and treasurer, Harrisburg, Pa.; S. W. Marshall, chief engineer.

PROJECT: Construction of Section RWF of the Turnpike, consisting of right-of-way fence in Westmoreland, Somerset, Bedford, Fulton, Huntingdon, Franklin and Cumberland Counties, the entire length of the project. Varies from one-strand to 8-ft. deer fence.

CONDITIONS: Contractor to furnish all materials and complete work in 65 calendar days. Highway transportation available. Common labor rate for work is 52½c. per hr. Construction virtually all on straight line.

BIDS: Four bids were opened May 10, 1940, ranging from the contract low of $328,476 to $573,479.

LOW BIDDERS:

1. Pittsburgh Steel Co., Pittsburgh, Pa. (contract) $328,476
2. Fox Valley Constr. Co., Appleton, Wis..... 392,138
3. Harrison Constr. Co., Pittsburgh, Pa..... 562,851

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Right-of-way fence, type 1	17,220 l. f.	$0.6229	$1.20	$2.00
2. Right-of-way fence, type 2	1,184,444 l. f.	.1092	.13	.18
3. Right-of-way fence, type 3	324,326 l. f.	.1462	.18	.19
4. Right-of-way fence, type 3 Mod.	54,624 l. f.	.1605	.195	.21
5. Right-of-way fence, type 4	22,192 lb.	.1108	.12	.40
6. End posts for r-o-w. fence, type 2	949 ea.	6.04	10.00	15.00
7. Corner posts for r-o-w. fence, type 2	4,364 ea.	7.80	11.00	18.00
8. End posts for r-o-w. fence, type 3	224 ea.	6.92	10.00	16.50
9. Corner posts for r-o-w. fence, type 3	1,502 ea.	8.61	12.00	22.50
10. 6½-ft. line posts	69,373 ea.	.6118	.57	.80
11. 7½-ft. line posts	1,950 ea.	.6938	.62	.90
12. 8½-ft. line posts	22,110 ea.	.7678	.70	1.00
13. 10-ft. line posts	1,950 ea.	1.2107	.75	1.10
14. Posts for r-o-w. fence, type 4	4,760 ea.	.6209	.53	.75
15. Coiled spring steel wire	12,500 lb.	.1108	.12	.24
16. Double vehicular gates	5 ea.	93.50	100.00	200.00
17. Extra height double vehicular gates	4 ea.	118.50	105.00	250.00
18. Single vehicular gates	2 ea.	52.50	60.00	150.00
19. Pedestrian gates	13 ea.	25.00	40.00	100.00
20. Structure gate	257 l. f.	2.60	3.00	5.00
21. Unclassified excavation	2,000 c. y.	3.00	2.00	5.00

OUTLET WORKS, BLUE MOUNTAIN DAM, ARKANSAS

OWNER: U. S. Engineer Office, Little Rock, Ark.

PROJECT: Construction of outlet works for Blue Mountain Dam on Petit Jean River in Yell County, Arkansas, 1½ miles southwest of Waveland, Ark. Entire project includes rolled earth fill dam 2700 ft. long, approximately 82 ft. high. Work covered in this contract consists of approach channel, intake structure, tunnel, stilling basin, and outlet channel. Construction of earth dam, spillway, and dikes may be carried on at same time as this project.

CONDITIONS: Contractor to furnish all materials and complete work in 400 calendar days. Railroads, highways and bridges exist in vicinity of work. Wages are: skilled labor, $1.00 to $1.50 per hr.; semi-skilled, 40 to 75c.; and common labor, 30c. per hr.

BIDS: Twelve bids were opened May 28, 1940, ranging from the low of $686,877 to $933,668. Engineer's estimate, $806,659.

LOW BIDDERS:

1. John Kerns Constr. Co., Omaha, Neb..... $686,877
2. Winston Bros. Co. and Missouri Valley Bridge & Iron Co., Leavenworth, Kan..... 692,140
3. Guy H. James, Norman, Okla..... 715,555

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Clearing site	12 ac.	$84.00	$300.00	$150.00
2. Common excav., general	63,500 c. y.	.35	.50	.40
3. Common excav., outlet channel	175,000 c. y.	.35	.35	.25
4. Rock excav., general	39,000 c. y.	.76	1.00	1.00
5. Rock excav., outlet channel	4,500 c. y.	.76	1.00	1.00
6. Rock excavation, access road	21,250 c. y.	.76	1.00	1.00
7. Rock excavation, trenches	150 c. y.	6.00	5.00	6.00
8. Tunnel excav., unclass.	18,750 c. y.	4.66	6.00	5.00
9. Protect. trtmt., for shale	125 sq.	4.66	2.00	3.00
10. Foundation preparation	200 sq.	20.00	10.00	10.00
11. Backfill	2,500 c. y.	.22	.60	1.00
12. Close line drilling	23,100 s. f.	.48	.25	.75
13. Percussion drilling, 2-in. holes	1,600 l. f.	.60	.30	1.25
14. Percussion drilling, 3¼-in. holes	1,250 l. f.	.90	.50	2.00
15. Pressure grouting	10,000 c. f.	1.00	.90	1.40
16. Setting anchors	145 ea.	1.00	1.00	2.00
17. Timbering in tunnel	15 M.b.m.	124.00	90.00	110.00
18. Steel ribs in tunnel	43,000 lb.	.06	.05	.06
19. Steel liner plates, tunnel	34,000 lb.	.06	.05	.075
20. Crushed rock	4,700 c. y.	1.81	2.00	2.00
21. Dumped riprap	10,000 c. y.	1.81	1.50	1.90
22. Derrick stone	300 c. y.	2.58	3.00	5.00
23. Rock gutter paving	200 c. y.	5.22	6.00	6.00
24. Furn. cement, concrete only	23,000 bbl.	2.63	2.30	2.80
25. Concrete, gate tower	4,300 c. y.	12.64	10.00	9.00
26. Conc., forebay and still. basin	5,600 c. y.	7.48	9.00	7.00
27. Conc., lower transition	260 c. y.	8.19	10.00	11.00
28. Concrete, tunnel intake	500 c. y.	7.66	9.00	9.00
29. Conc., tunnel upper transition	660 c. y.	8.03	9.00	11.00
30. Conc., tunnel circ. section	6,300 c. y.	7.33	9.00	10.00
31. Reinforcing steel	1,100,000 lb.	.01	.033	.04
32. Copper water stops	10,000 lb.	.32	.40	.50
33. Corr. resist. steel water stops	2,700 lb.	.60	.60	1.00
34. Brass and bronze	325 lb.	.94	1.00	1.00
35. W. I. pipe and fittings	1,200 lb.	.21	.15	.13
36. Black steel pipe and fittings	16,000 lb.	.21	.07	.11
37. 4-in. gate valve	1 ea.	32.00	30.00	30.00
38. Handrailing and guards	11,000 lb.	.19	.20	.25
39. Corr. met. pipe, 18-in. semi-circ.	300 l. f.	2.52	2.00	2.00
40. Corr. met. pipe, 12-in.	100 l. f.	1.90	1.50	1.50
41. Miscellaneous metal	40,000 lb.	.18	.09	.15
42. Gates, hoists and accessories	L. S.	82,931.00	75,000.00	80,300.00
43. Conduit lining	L. S.	13,031.00	10,000.00	11,670.00
44. Stand-by unit	L. S.	4,000.00	3,500.00	5,000.00
45. Traveling crane	L. S.	7,052.00	6,500.00	8,000.00
46. Power and lighting system	L. S.	1,000.00	3,000.00	4,600.00
47. Electrical conduit	2,000 lb.	.30	.25	.20
48. Tile gages	115 l. f.	6.66	5.00	6.00
49. Operating house	L. S.	15,000.00	11,000.00	16,000.00

AQUEDUCT TUNNEL NEWARK, N. J.

OWNER: Division of Water, City of Newark, N. J.

PROJECT: Construction of aqueduct consisting of tunnel and 48-in. pipe under D. L. & W. RR., Seventh St., Newark, N. J. to carry water main under tracks. Two 50-ft. shafts for cement-lined concrete and steel tunnel are required.

CONDITIONS: Contractor to furnish all materials. Highway transportation available. Wages prevailing in Newark are: skilled labor $1.50 to $2.15 per hr., and common, $1.12½.

BIDS: Nine bids were received May 6, 1940, ranging from $46,318 to $88,225.

LOW BIDDERS:

1. C. Salvatore & Co., Inc., Orange, N. J..... $46,318
2. John L. Washbourne, Inc., New York, N. Y... 47,985
3. Ell-Dorer Contracting Co., Irvington, N. J.... 50,630

Item	Quan.	Unit Prices (1)	(2)	(3)
1. 48-in. steel pipe	330 l. f.	$35.60	$41.00	$39.00
2. Earth excavation	900 c. y.	2.00	4.00	4.25
3. Tunnel rock excavation	500 c. y.	10.00	15.00	15.00
4. Rock excavation	1,000 c. y.	8.00	7.50	6.25
5. Portland cement	1,400 bbl.	3.00	2.50	2.50
6. Concrete in tunnel	150 c. y.	30.00	17.00	35.00
7. Conc., other than tunnel	450 c. y.	15.00	13.00	23.50
8. Grout	30 c. y.	10.00	30.00	25.00
9. Brick masonry	25 c. y.	32.00	43.00	30.00
10. Reinforcing steel	25,000 lb.	.10	.06	.08
11. Structural steel	6,000 lb.	.12	.08	.06